State of California — The Resources Agency
DEPARTMENT OF PARKS AND RECREATION

PRIMARY RECORD

Primary #_____
HRI #_____
Trinomial_____
NRHP Status Code_____
Other Listings_____
Review Code_____ Reviewer_____ Date_____

 Resource name(s) or number(assigned by recorder) N-218

P1. Other Identifier: Safety, Environmental & Mission Assurance, 14' Transonic Wind Tunnel Laboratory

***P2. Location:** ☒Not for Publication ☐Unrestricted ***a. County** Santa Clara
***b. USGS 7.5' Quad** San Francisco North, Calif. **Date:** 1995
***c. Address** 320 Durand Road **City** Moffett Field **Zip** 94035
***e. Other Locational Data:**

***P3a. Description:** (Describe resource and its major elements. Include design, materials, condition, alterations, size, setting, and boundaries.)

Building N-218 is located on Durand Road and is connected to a 14-foot transonic wind tunnel at the back (north) of the building. Building N-218 is two stories in height with a tower at the back of the building that reaches up an additional two stories. Building N-218 is an industrial style building with moderne features. It has a concrete foundation, exposed concrete walls, and a flat roof. The building's massing is simple and ornamental detail is minimal. This building features simple, flat, horizontal concrete bands that run across each façade. The ground floor fronts Durand Road and the second story is stepped back from the front of the building about 20'. The building has one over three metal windows that are sandwiched between the concrete bands. These windows are grouped and spaced regularly between concrete piers with grooves that align with the window mullions. The building's main entry is emphasized with a simple concrete awning with rounded corners. The entry doors are aluminum storefront and are not original to the building. The four-story tower is centered behind the main entry. The rear (north) side of the building has an addition. The addition is steel framed and clad with corrugated metal. This addition connects to the 14-foot wind tunnel behind Building N-218. Building N-218 has been retrofitted with an exterior steel stair with concrete treads on the west side. This stair has a connection to the wind tunnel and also goes down to ground level. It is 38,240 sq. ft.

This building appears to be in good condition.

***P3b. Resource Attributes:** (list attributes and codes) HP39 – Other: Wind Tunnel

***P4. Resources Present:** ☒Building ☐Structure ☐Object ☐Site ☐District ☐Element of District ☐Other

P5a. Photo

P5b. Photo: (view and date)
View of east facade, (8/12/05)

***P6. Date Constructed/Age and Sources:** 1941

***P7. Owner and Address:**
United States of America as represented by National Aeronautics and Space Administration (NASA)

***P8. Recorded by:**
Page & Turnbull, Inc.
724 Pine Street
San Francisco, CA 94108

***P9. Date Recorded:** 08/12/05

***P10. Survey Type:**
Reconnaissance

***P11. Report Citation:** Lori Neff, *Department of Parks and Recreation – Historic Resources Inventory "Bldg. N218, 14 Ft. Transonic Wind Tunnel,"* (1995).

***Attachments:** ☐None ☐Location Map ☐Sketch Map ☐Continuation Sheet ☒Building, Structure, and Object Record
☐Archaeological Record ☐District Record ☐Linear Feature Record ☐Milling Station Record ☐Rock Art Record
☐Artifact Record ☐Photograph Record ☐ Other (list)

BUILDING, STRUCTURE, AND OBJECT RECORD

*NRHP Status Code 5D3

*Resource Name or # N-218

B1. Historic name: 14 ft Transonic Wind Tunnel
B2. Common name: 14 ft Transonic Wind Tunnel & Laboratory
B3. Original Use: Wind Tunnel and Laboratory B4. Present use: Wind Tunnel and Laboratory
***B5. Architectural Style:** Moderne with 20th-Century Industrial influences
***B6. Construction History:** (Construction date, alterations, and date of alterations)
1948 – Date of Construction; 1952 to 1955 – Interior alterations and wind tunnel modification

***B7. Moved?** ☒No ☐Yes ☐Unknown **Date:**_____ **Original Location:**_____
***B8. Related Features:**
Significant architectural features include concrete exterior, connection to wind tunnel, steel and wood-sash windows, and concrete entry canopy.
B9a. Architect: National Advisory Committee for Aeromautics (NACA) Engineers b. Builder:
***B10. Significance: Theme** Post-War Science and Space Exploration **Area** NASA Ames Research Center
Period of Significance 1940-1958 **Property Type** Research Facility **Applicable Criteria** 1 & 3
(Discuss importance in terms of historical or architectural context as defined by theme, period, and geographic scope. Also address integrity)

Originally built for the 14-ft Transonic Wind Tunnel, Building N-218 has maintained this usage over the building's lifetime. This wind tunnel is one of several research and support buildings built between 1940 and 1958. Founded in 1939, the Ames Research Center was the second aeronautic research facility built for the National Advisory Committee for Aeronautics (NACA). This research center was vital in the development of the field of aeronautical research and science. Along with new research facilities, such as wind tunnels and testing facilities, several support buildings were constructed for the staff, including libraries, offices, manufacturing facilities, and laboratories. During this time period, these research and support buildings were rendered in a specific architectural vocabulary, which allowed for a variety of uses and a cohesive campus setting. These buildings were most often, one and two stories in height with concrete structural systems, unpainted concrete exteriors (with scored concrete detailing), and steel or wood-sash awning or hopper windows. They expressed Moderne architectural details with their scored exteriors, tripartite concrete panels (located between windows and doors), concrete entry canopies, and rectilinear configurations. Additionally, these buildings exhibited influences of 20th-Century Industrial architecture with their smooth, concrete exteriors and steel-sash awning and hopper windows. Today, the exterior of this building retains more historical significance than the interior, which has been altered. Portions of the wind tunnel were reconstructed between 1952 and 1955. Despite these changes, Building N-218 still possesses integrity of location, design, setting, materials, workmanship, feeling, and association. The original wind tunnel was constructed as a Subsonic 16-ft Wind Tunnel. It has been re-built into a 14-ft Test Section Wind Tunnel. See Continuation Sheet for wind tunnel description.

B11. Additional Resource Attributes: (List attributes and codes) (HP11) – Engineering Structure; (HP39) -- Research and Development Building; (HP39) -- Wind Tunnel

***B12. References (also refer to Continuation Sheets):**

- Lori Neff, *Department of Parks and Recreation – Historic Resources Inventory "Bldg. N218, 14 Ft. Transonic Wind Tunnel,"* (1995).
- Edwin Hartman, *Adventures in Research: A History of Ames Research Center, 1940 – 1965* (NASA SP-4302, 1970).
- Elizabeth A. Muenger, *Searching the Horizon: A History of Ames Research Center, 1940 – 1976* (NASA SP-4304, 1985).
- Glenn Burgos, *Atmosphere of Freedom: Sixty Years at the NASA Ames Research Center* (NASA SP-4314, 2000).

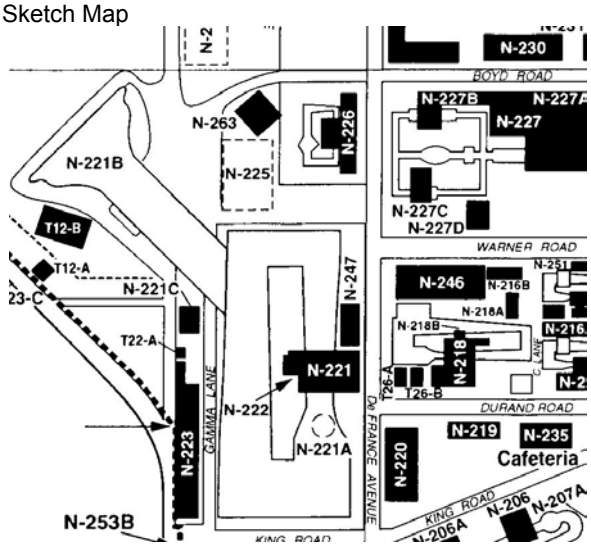
B13. Remarks:
In 1995, Section 110 survey documentation of the NASA Ames Research Center was submitted to the California State Historic Preservation Office (SHPO).

***B14. Evaluator:** Rich Sucre, Page & Turnbull, Inc.
724 Pine Street, San Francisco, CA 94108

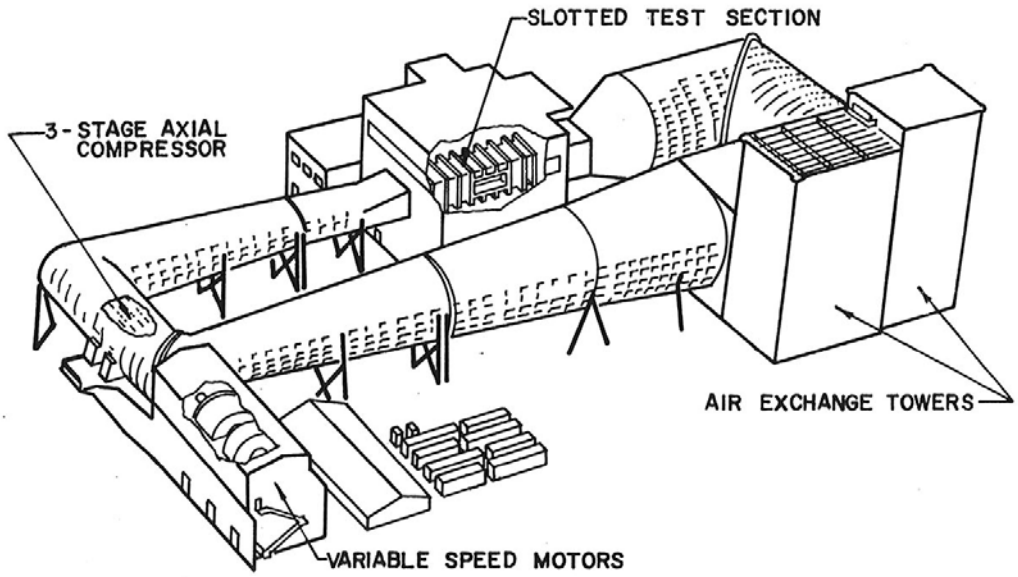
***Date of Evaluation:** 10/18/2005

(This space reserved for official comments.)

Sketch Map



N218



DESCRIPTION

This wind tunnel has an adjustable, flexible-wall nozzle. The test section is slotted on all 4 sides to permit transonic testing. The air circuit is closed except for the air exchanger, in a low-speed section of the circuit, which is controlled to maintain the air temperature within suitable limits. The air is driven by a 3-stage, axial-flow compressor powered by 3 electric motors mounted in tandem outside the wind tunnel. The drive system is rated at 110,000 hp continuously, or 132,000 hp for one hr. The speed of the motors is continuously variable over the operating range.

CHARACTERISTICS

Mach Number:	0.6 to 1.2, continuously variable
Reynolds Number, per ft:	2.8×10^6 to 4.2×10^6
Stagnation Pressure, atm:	1.0
Stagnation Temperature:	Controllable over limited range by throttling the air exchanger; generally about 640°R to avoid condensation of moisture in the test section
Test-Section Height, ft:	13.50
Test-Section Width, ft:	13.71 at upstream end 13.92 at downstream end
Test-Section Length, ft:	33.75
Test-Section Doors, ft:	6.7 high x 8.0 wide, in both sides of wind tunnel

CURRENT STATUS ~~1-13~~ INACTIVE; SCHEDULED FOR DEMOLITION

4. FOURTEEN-FOOT TRANSONIC WIND TUNNEL

DESCRIPTION:

The Fourteen-Foot Transonic Wind Tunnel is a closed-circuit tunnel equipped with an adjustable, flexible-wall nozzle and a test section with four slotted walls. (The air circuit is closed except for the air exchanger, in a low-speed section, which is controlled to maintain suitable air temperature.) Airflow is produced by a three-stage, axial-flow compressor powered by three variable-speed, electric motors mounted in tandem outside the tunnel, rated at 110,000 horsepower continuously or 132,000 hp for one hour.

For conventional, steady-state testing models are generally supported on an adjustable sting. Internal, strain-gage balances are used for measuring forces and moments. Additional facilities are available for measuring multiple steady or fluctuating pressures, as well as variable-speed compact model motors with a variable-frequency power source.

A schlieren system is available for flow visualization.

PERFORMANCE:

Mach Number	0.6 to 1.2 (continuously variable)
Stagnation Pressure	1.0 atmosphere
Reynolds Number	2.8×10^6 to 4.2×10^6 per foot
Stagnation Temperature	Generally 640°R

DIMENSIONS: Test Section

Height	13.5 feet
Width	13.71 feet (upstream) 13.92 feet (downstream)
Length	33.75 feet
Access	Side doors — 6.7 X 8.0 feet

STATUS:

Operational since 1956

JURISDICTION:

Aeronautics Division
Experimental Investigations Branch
Stuart Treon

LOCATION:

Building N-218

***B12. References (cont'd):**

- National Aeronautics and Space Administration, *Technical Facilities Catalog*, Volume 1, publication NHB 8800.5A (1), October 1974.
- Technical Information Division, Ames Research Center, *Ames Research Facilities Summary,* 1974.
- Donald D. Baals and William R. Corliss, *Wind Tunnels of NASA,* NASA SP-440, 1981.

State of California — The Resources Agency
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PRIMARY RECORD

Primary #
HRI #
Trinomial
NRHP Status Code
Other Listings
Review Code Reviewer Date

Page 1 of 1 **Resource name(s) or number**(assigned by recorder) N-218A

P1. Other Identifier: Electrical Equipment Building

***P2. Location:** ☒Not for Publication ☐Unrestricted ***a. County** Santa Clara
***b. USGS 7.5' Quad** San Francisco North, Calif. **Date:** 1995
***c. Address** 330 Durand Road **City** Moffett Field **Zip** 94035
***e. Other Locational Data:**

***P3a. Description:** (Describe resource and its major elements. Include design, materials, condition, alterations, size, setting, and boundaries.)

Building N-218A is a Butler industrial building located midblock on Durand Road behind the N-218 Wind Tunnel. Building N-218A is a steel framed building with metal panel siding. This building is utilitarian in nature and has no architectural ornamentation. It has a low-slope gable roof, a sliding metal door on the north side, and hollow metal doors on the south and east sides. This building has several louvered openings. It is utilized as an electrical equipment building and is 5,400 sq. ft. in size.

This building appears to be in fair condition.

***P3b. Resource Attributes:** (list attributes and codes) HP 8– Industrial Building

***P4. Resources Present:** ☒Building ☐Structure ☐Object ☐Site ☐District ☐Element of District ☐Other

P5a. Photo

P5b. Photo: (view and date)
View of north façade, (8/12/05)

***P6. Date Constructed/Age and Sources:** 1984

***P7. Owner and Address:**
United States of America as represented by National Aeronautics and Space Administration (NASA)

***P8. Recorded by:**
Page & Turnbull, Inc.
724 Pine Street
San Francisco, CA 94108

***P9. Date Recorded:** 08/12/05

***P10. Survey Type:**
Reconnaissance

***P11. Report Citation:** Architectural Resources Group, *Building Evaluations, NASA Ames Research Center, Moffett Field, California* (July 27, 2001)

***Attachments:** ☒None ☐Location Map ☐Sketch Map ☐Continuation Sheet ☐Building, Structure, and Object Record
☐Archaeological Record ☐District Record ☐Linear Feature Record ☐Milling Station Record ☐Rock Art Record
☐Artifact Record ☐Photograph Record ☐Other (list)

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Other Listings_____
Review Code_____ Reviewer_____ Date_____

Page 1 of 1 **Resource name(s) or number**(assigned by recorder) N-218B

P1. Other Identifier: Storage Shed

***P2. Location:** ☒Not for Publication ☐Unrestricted ***a. County** Santa Clara
***b. USGS 7.5' Quad** San Francisco North, Calif. **Date:** 1995
***c. Address** 340 Durand Road **City** Moffett Field **Zip** 94035
***e. Other Locational Data:**

***P3a. Description:** (Describe resource and its major elements. Include design, materials, condition, alterations, size, setting, and boundaries.)

Building N-218B is an industrial building located midblock on Durand Road, adjacent to the N-218 Wind Tunnel. Building N-218B is a steel framed building with box-rib metal siding and a flat roof. This building is utilitarian in nature and has no architectural ornamentation. It has a roll-up metal door on the east side and a hollow metal door on the south side. The building has been used as a fan verification facility and is 340 sq. ft.

This building appears to be in fair condition.

***P3b. Resource Attributes:** (list attributes and codes) HP 4– Ancillary Building, Storage Shed

***P4. Resources Present:** ☒Building ☐Structure ☐Object ☐Site ☐District ☐Element of District ☐Other

P5a. Photo

P5b. Photo: (view and date)
View of North Façade, (8/12/05)

***P6. Date Constructed/Age and Sources:** 1952

***P7. Owner and Address:**
United States of America as represented by National Aeronautics and Space Administration (NASA)

***P8. Recorded by:**
Page & Turnbull, Inc.
724 Pine Street
San Francisco, CA 94108

***P9. Date Recorded:** 08/12/05

***P10. Survey Type:**
Reconnaissance

***P11. Report Citation:** None

***Attachments:** ☒None ☐Location Map ☐Sketch Map ☐Continuation Sheet ☐Building, Structure, and Object Record ☐Archaeological Record ☐District Record ☐Linear Feature Record ☐Milling Station Record ☐Rock Art Record ☐Artifact Record ☐Photograph Record ☐ Other (list)